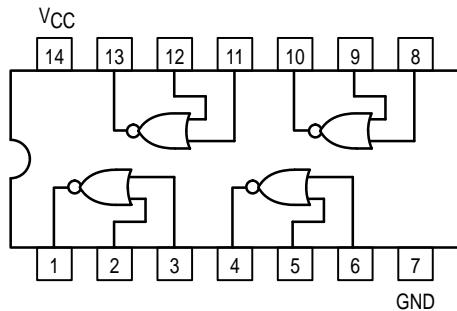




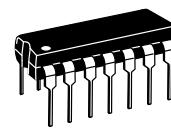
**MC74AC02
MC74ACT02**

Quad 2-Input NOR Gate

- Outputs Source/Sink 24 mA
- 'ACT02 Has TTL Compatible Inputs



QUAD 2-INPUT
NOR GATE



N SUFFIX
CASE 646-06
PLASTIC



D SUFFIX
CASE 751A-03
PLASTIC

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
V _{in}	DC Input Voltage (Referenced to GND)	-0.5 to V _{CC} +0.5	V
V _{out}	DC Output Voltage (Referenced to GND)	-0.5 to V _{CC} +0.5	V
I _{in}	DC Input Current, per Pin	±20	mA
I _{out}	DC Output Sink/Source Current, per Pin	±50	mA
I _{CC}	DC V _{CC} or GND Current per Output Pin	±50	mA
T _{stg}	Storage Temperature	-65 to +150	°C

* Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

MC74AC02 MC74ACT02

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Typ	Max	Unit
V _{CC}	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V _{in} , V _{out}	DC Input Voltage, Output Voltage (Ref. to GND)		0		V _{CC}	V
t _r , t _f	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	V _{CC} @ 3.0 V		150		ns/V
		V _{CC} @ 4.5 V		40		
		V _{CC} @ 5.5 V		25		
t _r , t _f	Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs	V _{CC} @ 4.5 V		10		ns/V
		V _{CC} @ 5.5 V		8.0		
T _J	Junction Temperature (PDIP)				140	°C
T _A	Operating Ambient Temperature Range		-40	25	85	°C
I _{OH}	Output Current — High				-24	mA
I _{OL}	Output Current — Low				24	mA

1. V_{in} from 30% to 70% V_{CC}; see individual Data Sheets for devices that differ from the typical input rise and fall times.

2. V_{in} from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74AC		Unit	Conditions
			T _A = +25°C	T _A = -40°C to +85°C		
			Typ	Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V
V _{IL}	Maximum Low Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V
V _{OH}	Minimum High Level Output Voltage	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	V	I _{OUT} = -50 μA
		3.0 4.5 5.5		2.56 3.86 4.86	V	*V _{IN} = V _{IL} or V _{IH} -12 mA I _{OH} -24 mA -24 mA
V _{OL}	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	V	I _{OUT} = 50 μA
		3.0 4.5 5.5		0.36 0.36 0.36	V	*V _{IN} = V _{IL} or V _{IH} 12 mA I _{OL} 24 mA 24 mA
I _{IN}	Maximum Input Leakage Current	5.5		±0.1	μA	V _I = V _{CC} , GND
I _{OLD}	†Minimum Dynamic Output Current	5.5		75	mA	V _{OLD} = 1.65 V Max
I _{OHD}		5.5		-75	mA	V _{OHD} = 3.85 V Min
I _{CC}	Maximum Quiescent Supply Current	5.5		4.0	μA	V _{IN} = V _{CC} or GND

* All outputs loaded; thresholds on input associated with output under test.

† Maximum test duration 2.0 ms, one output loaded at a time.

Note: I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V_{CC}.

MC74AC02 MC74ACT02

AC CHARACTERISTICS (For Figures and Waveforms — See Section 3)

Symbol	Parameter	V_{CC}^* (V)	74AC			74AC		Unit	Fig. No.		
			$T_A = +25^\circ C$ $C_L = 50 \text{ pF}$			$T_A = -40^\circ C$ to $+85^\circ C$ $C_L = 50 \text{ pF}$					
			Min	Typ	Max	Min	Max				
t_{PLH}	Propagation Delay	3.3 5.0	1.5 1.5	5.0 4.0	7.5 6.0	1.0 1.0	8.0 6.5	ns	3-5		
t_{PHL}	Propagation Delay	3.3 5.0	1.5 1.5	5.0 4.5	7.5 6.5	1.0 1.0	8.0 7.0	ns	3-5		

* Voltage Range 3.3 V is $3.3 \text{ V} \pm 0.3 \text{ V}$.

Voltage Range 5.0 V is $5.0 \text{ V} \pm 0.5 \text{ V}$.

DC CHARACTERISTICS

Symbol	Parameter	V_{CC} (V)	74ACT		74ACT		Unit	Conditions		
			$T_A = +25^\circ C$		$T_A = -40^\circ C$ to $+85^\circ C$					
			Typ	Guaranteed Limits						
V_{IH}	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	2.0 2.0	V	$V_{OUT} = 0.1 \text{ V}$ or $V_{CC} - 0.1 \text{ V}$		
V_{IL}	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	0.8 0.8	V	$V_{OUT} = 0.1 \text{ V}$ or $V_{CC} - 0.1 \text{ V}$		
V_{OH}	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	4.4 5.4	V	$I_{OUT} = -50 \mu\text{A}$		
		4.5 5.5		3.86 4.86	3.76 4.76	3.76 4.76	V	$*V_{IN} = V_{IL} \text{ or } V_{IH}$ $I_{OH} = -24 \text{ mA}$		
V_{OL}	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	0.1 0.1	V	$I_{OUT} = 50 \mu\text{A}$		
		4.5 5.5		0.36 0.36	0.44 0.44	0.44 0.44	V	$*V_{IN} = V_{IL} \text{ or } V_{IH}$ $I_{OL} = 24 \text{ mA}$		
I_{IN}	Maximum Input Leakage Current	5.5		± 0.1	± 1.0	± 1.0	μA	$V_I = V_{CC}, \text{ GND}$		
ΔI_{CCT}	Additional Max. I_{CC} /Input	5.5	0.6		1.5	1.5	mA	$V_I = V_{CC} - 2.1 \text{ V}$		
I_{OLD}	†Minimum Dynamic Output Current	5.5			75	75	mA	$V_{OLD} = 1.65 \text{ V Max}$		
I_{OHD}		5.5			-75	-75	mA	$V_{OHD} = 3.85 \text{ V Min}$		
I_{CC}	Maximum Quiescent Supply Current	5.5		4.0	40	40	μA	$V_{IN} = V_{CC} \text{ or GND}$		

* All outputs loaded; thresholds on input associated with output under test.

† Maximum test duration 2.0 ms, one output loaded at a time.

MC74AC02 MC74ACT02

AC CHARACTERISTICS (For Figures and Waveforms — See Section 3)

Symbol	Parameter	V_{CC}^* (V)	74ACT			74ACT		Unit	Fig. No.		
			$T_A = +25^\circ C$ $C_L = 50 \text{ pF}$			$T_A = -40^\circ C$ to $+85^\circ C$ $C_L = 50 \text{ pF}$					
			Min	Typ	Max	Min	Max				
t_{PLH}	Propagation Delay	5.0	1.5		8.5	1.0	9.0	ns	3-6		
t_{PHL}	Propagation Delay	5.0	1.5		9.5	1.0	10	ns	3-6		

* Voltage Range 5.0 V is 5.0 V ± 0.5 V.

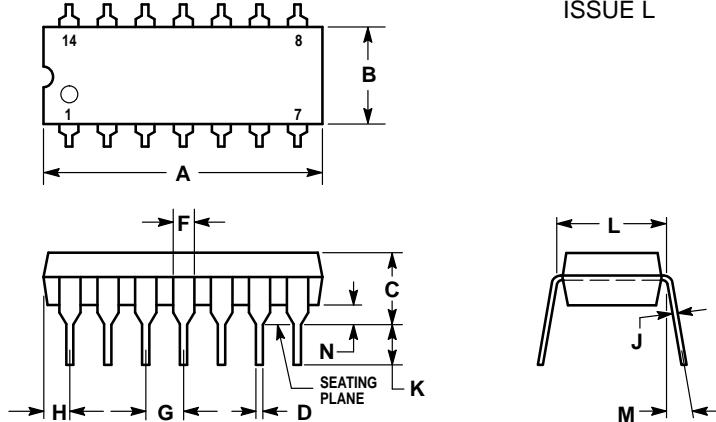
CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C_{IN}	Input Capacitance	4.5	pF	$V_{CC} = 5.0$ V
C_{PD}	Power Dissipation Capacitance	30	pF	$V_{CC} = 5.0$ V

MC74AC02 MC74ACT02

OUTLINE DIMENSIONS

N SUFFIX
PLASTIC DIP PACKAGE
CASE 646-06
ISSUE L

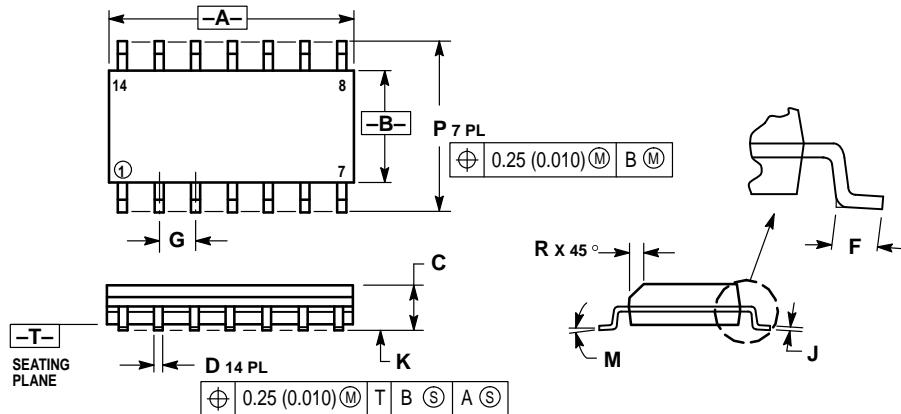


NOTES:

- LEADS WITHIN 0.13 (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
- DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
- DIMENSION B DOES NOT INCLUDE MOLD FLASH.
- ROUNDED CORNERS OPTIONAL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.715	0.770	18.16	19.56
B	0.240	0.260	6.10	6.60
C	0.145	0.185	3.69	4.69
D	0.015	0.021	0.38	0.53
F	0.040	0.070	1.02	1.78
G	0.100 BSC		2.54 BSC	
H	0.052	0.095	1.32	2.41
J	0.008	0.015	0.20	0.38
K	0.115	0.135	2.92	3.43
L	0.300 BSC		7.62 BSC	
M	0°	10°	0°	10°
N	0.015	0.039	0.39	1.01

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751A-03
ISSUE F



NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER.
- DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
- MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
- DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.55	8.75	0.337	0.344
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.228	0.244
R	0.25	0.50	0.010	0.019

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